Leveraging Generative AI and Large Language Models: A Comprehensive Roadmap for Healthcare Integration

Year: 2023 | *Citations: 193* | *Authors: Ping Yu, Hua Xu, Xia Hu*

Abstract

Generative artificial intelligence (AI) and large language models (LLMs), exemplified by ChatGPT, are promising for revolutionizing data and information management in healthcare and medicine. However, there is scant literature guiding their integration for non-AI professionals. This study conducts a scoping literature review to address the critical need for guidance on integrating generative AI and LLMs into healthcare and medical practices. It elucidates the distinct mechanisms underpinning these technologies, such as Reinforcement Learning from Human Feedback (RLFH), including few-shot learning and chain-of-thought reasoning, which differentiates them from traditional, rule-based AI systems. It requires an inclusive, collaborative co-design process that engages all pertinent stakeholders, including clinicians and consumers, to achieve these benefits. Although global research is examining both opportunities and challenges, including ethical and legal dimensions, LLMs offer promising advancements in healthcare by enhancing data management, information retrieval, and decision-making processes. Continued innovation in data acquisition, model fine-tuning, prompt strategy development, evaluation, and system implementation is imperative for realizing the full potential of these technologies. Organizations should proactively engage with these technologies to improve healthcare quality, safety, and efficiency, adhering to ethical and legal guidelines for responsible application.